

DESCRIPTION OF THE COURSES

- Course code: ELR1277
- Course title: **FUNDAMENTALS OF MATERIALS ENGINEERING 2**
- Language of the lecturer: Polish

<i>Course form</i>	<i>Lecture</i>	<i>Classes</i>	<i>Laboratory</i>	<i>Project</i>	<i>Seminar</i>
<i>Number of hours/week*</i>			2		
<i>Number of hours/semester*</i>			20		
<i>Form of the course completion</i>			Reports		
<i>ECTS credits</i>			2		
<i>Total Student's Workload</i>			60		

- Level of the course (basic/advanced): basic
- Prerequisites: Lecture of Fundamentals of Materials Engineering I
- Name, first name and degree of the lecturer/supervisor: Jerzy Rutkowski, PhD
- Names, first names and degrees of the team's members:

Ryszard Kacprzyk, DSc., Ph. D.

Anna Kisiel, Ph. D.

Bożena Łowkis, Ph. D.

Adam Tymań, Ph. D.

Leszek Woźny, Ph. D.

Jan Ziaja, Ph. D.

Zbigniew Zubel, Ph. D.

Paweł Żyłka, Ph. D.

- Year:....I..... Semester:.....2.....
- Type of the course (obligatory/optional): obligatory
- Aims of the course (effects of the course):

Understanding of physical phenomena which take place in materials, ability to join knowledge of structure and technological processes of materials manufacturing with their application to modern construction in electrical engineering.

- Form of the teaching (traditional/e-learning): traditional

- Course description:

Physicochemical basis of the structure of matter and relationships between the properties of materials and their molecular structure as well as micro- and macro-structure. Physical phenomena observed in materials due to electric, thermal and mechanical stresses. Basic properties characterizing conducting materials, semiconductors, dielectrics and magnetic and their functional dependencies. A short characteristic of the particular groups of materials and their applications. Methods of testing basic properties of electrochemical materials.

- Lecture:

<i>Particular lectures contents</i>	<i>Number of hours</i>
I.	

- Classes – the contents:
- Seminars – the contents:
- Laboratory – the contents:

Particular acquaintance with materials as well as normalized and unconventional methods of testing their properties. Acquiring skill in using Polish standards and evaluating of materials. Examination of the basic electric, magnetic, chemical, mechanical and thermal properties of materials and their arrangements.

1. Investigation of dielectric resistivity.
2. Testing of electrical permittivity.
3. Measurements of dielectric loss factor.
4. Investigation of electric stress.
5. Investigation of magnetic properties of ferromagnetic samples.
6. Investigation of mechanical properties of insulated materials.
7. Investigation of thermal properties .
8. Investigation of selected properties of liquid dielectric.

- Project – the contents:

- Basic literature:

1. Celiński Z., Materiałoznawstwo elektrotechniczne, Oficyna Wyd. Politechniki Warszawskiej, W-wa, 2005, 1998.
2. Blicharski M., Wstęp do inżynierii materiałowej, Wyd. AGH, Kraków, 2003.
3. Kolbiński K., Słowikowski J., Materiałoznawstwo elektrotechniczne, WNT, 1988
4. Podstawy inżynierii materiałowej. Laboratorium. Oficyna Wyd. Politechniki Wrocławskiej 2005.

- Additional literature:
- Conditions of the course acceptance/creditation: Successful completion of laboratory reports.

* - depending on a system of studies